

## *Acanthopagrus chinshira*, a New Sparid Fish (Perciformes: Sparidae) from the East Asia

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**Abstract** A new sparid fish, *Acanthopagrus chinshira*, is described on the basis of specimens collected from Nakagusuku Bay and Haneji Inlet, Okinawa Island, the Ryukyu Islands, Japan. Although the present new species has been often misidentified as *Acanthopagrus australis* (Günther), morphological and genetic evidence showed that it is clearly different from the latter species. This species is distinguished from the other congeners by having the following combination of characters: pale (yellow when fresh) pelvic and anal fins, dorsal-fin rays XI, 11, 4 1/2 scale rows between lateral line and base of middle dorsal spine, 6 rows of cheek scales; no diffuse black blotch at origin of lateral line, and no black spot on upper base of pectoral fin. This species is currently known from Okinawa Island, Japan, northwest coast of Taiwan, and Hong Kong.

**Key words:** Sparidae, new species, *Acanthopagrus chinshira*, East Asia, Okinawa Island.

The sparid fishes of the genus *Acanthopagrus* are coastal marine fishes that are important as food fishes in tropical and temperate waters of the Indo-West Pacific. Among the 3 species found in the Ryukyu Islands, Japan, the Okinawan yellow-fin seabream has been identified as conspecific with *Acanthopagrus australis* (Günther, 1859) (e.g., Akazaki, 1962, 1984) or treated as a species of unknown taxonomic status (e.g., Akazaki, 1997; Hayashi, 2000). Recent study of allozyme electrophoretic analysis showed that the Okinawan yellow-fin seabream is a distinct species (see Kume *et al.*, submitted). Subsequent morphological and taxonomical study revealed that the Okinawan yellow-fin seabream is an undescribed species, as described below.

### Materials and Methods

Counts and measurements follow Akazaki (1962, 1984) and Hubbs and Lagler (1964) with minor modifications. For the count of transverse series of scales between lateral line and median spinous dorsal fin [Akazaki's (1984) Trac], we

name it simply as “scale rows above lateral line”, which is the number of scale rows from the base of fifth or sixth dorsal-fin spine downward and backward to the lateral line, excluding the lateral-line scale, but including the uppermost row of smaller scales expressed as 1/2. Internarial width is the least width between the anterior narial openings. Standard length and head length are expressed as SL and HL, respectively. Institutional codes follow Eschmeyer (1998), with additional institutional abbreviations as follows: Division of Fisheries Science, University of Miyazaki, Japan (MUFS); Shanghai Fisheries University, China (SFU).

### *Acanthopagrus chinshira* sp. nov.

(Japanese name: Okinawa-kichinu)

(Figs. 1–4)

*Acanthopagrus sivicolus* (not of Akazaki): Masuda *et al.*, 1975: 231, pl. 57-F (in part, Ryukyu Is., Japan).

*Mylio berda* (not of Forsskal): Au, 1978: 628, fig. 1 (northern shelf of South China Sea).

*Acanthopagrus australis* (not of Günther): Akazaki, 1984: 178, pl. 167-E (Okinawa I., Japan); Jean and Lee,

1992: 221, fig. 1 (Tanshui, northwest coast of Taiwan); Lee, 1993: 364, pl. 104-7 (Tanshui, northwest coast of Taiwan).

*Acanthopagrus* sp.: Akazaki, 1997: 353 (Sashiki, Nakagusuku Bay, Okinawa I., Japan); Hayashi, 2000: 857, 1567 (in part, Haneji Inlet, Okinawa I., Japan).

**Holotype.** NSMT-P 73081 (ex URM-P 41079), male, 204 mm SL, Nakagusuku Hama Fish Market, Nakagusuku Bay, Okinawa I., 23 Jan. 2001, collected by M. Kume.

**Paratypes (15 specimens, 102–399 mm SL, all from Japan).** FAKU 130713 (ex URM-P 41059), 106 mm SL, nearshore Atsuta, Nakagusuku Bay, Okinawa I., 13 Oct. 2000, collected by A. Hachimine; MUFS 23014 (ex URM-P 36915), 117 mm SL, Nago Fish Market, Okinawa I., 11 Dec. 1996, collected by H. Yoshigou, H. Mochizuki, N. Takei, S. Mutoh; MUFS 23015 (ex URM-P 41157), 112 mm SL, nearshore Atsuta, Nakagusuku Bay, Okinawa I., 1 Aug. 1997, collected by M. Tanaka; NSMT-P 63507 (ex URM-P 40969), 187 mm SL, Awase Fish Market, Nakagusuku Bay, Okinawa I., 13 Oct. 2000, collected by M. Kume; URM-P 23780, 232 mm SL, off Awase, Nakagusuku Bay, Okinawa I., 21 Feb. 1984, donated from Okinawa Fisheries Experimental Station; URM-P 41058, 105.4 mm SL, nearshore Atsuta, Nakagusuku Bay, Okinawa I., 13 Oct. 2000, collected by A. Hachimine; URM-P 40887, male, 131.1 mm SL, Atsuta, Nakagusuku Bay, Okinawa I., 29 June 2000, collected by A. Hachimine; URM-P 40888, 112 mm SL, Haneji Inlet, Okinawa I., 2

Sep. 2000, collected by M. Kume; URM-P 40889, 113 mm SL, Haneji Inlet, Okinawa I., 3 Sep. 2000, collected by M. Kume; URM-P 40891, 102 mm SL, Awase Fish Market, Nakagusuku Bay, Okinawa I., 15 Sep. 2000, collected by M. Kume; URM-P 41060, male, 244 mm SL, Nakagusuku Hama Fish Market, Nakagusuku Bay, Okinawa I., 11 Jan. 2001, collected by M. Kume; URM-P 41061, male, 399 mm SL, Nakagusuku Hama Fish Market, Nakagusuku Bay, Okinawa I., 19 Jan. 2001, collected by M. Kume; URM-P 41083, 59 mm SL, nearshore Awase, Nakagusuku Bay, Okinawa I., 4 July 2000, collected by M. Kume; URM-P 41141, male, 209 mm SL, Nakagusuku Hama Fish Market, Nakagusuku Bay, Okinawa I., 10 Feb. 2001, collected by M. Kume; URM-P 41144, female, 343 mm SL, Chinen Fish Market, Nakagusuku Bay, Okinawa I., 16 Feb. 2001, collected by M. Kume.

**Other materials (total 103 specimens).** Okinawa Island, Japan (97 specimens): URM-P 3521–3525, 5 specimens, 132–149 mm SL, Haneji Inlet; URM-P 4875, 290 mm SL, Naha Fish Market; URM-P 23539, 165 mm SL, Haneji Inlet; URM-P 23541–23553, 13 specimens, 223–297 mm SL, Chinen Fish Market, Nakagusuku Bay; URM-P 23780, 232 mm SL, off Awase, Nakagusuku Bay; URM-P 32553, 185 mm SL, nearshore Awase, Nakagusuku Bay; URM-P 32556 (skeletonized), about 400 mm SL, Haneji Inlet; URM-P 36915, 117 mm SL, Nago Fish Market; URM-P 40886, 186 mm SL, Awase Fish Market, Nakagusuku Bay; URM-P 40890, 90 mm SL, Hama, Nakagusuku Bay; URM-P 40969–40970, 2 specimens,



Fig. 1. *Acanthopagrus chinshira* sp. nov., URM-P 41079 (holotype), 204 mm SL, Nakagusuku Bay, Okinawa I., Japan.

177–187 mm SL, Awase Fish Market, Nakagusuku Bay; URM-P 40988–40989, 41058–41059, 4 specimens, 77–106 mm SL, nearshore Awase, Nakagusuku Bay; URM-P 41080–41082, 41084–41099, 41102–41138, 55 specimens, 36–69 mm SL, nearshore Awase, Nakagusuku Bay; URM-P 41139–41140, 2 specimens, 294–305 mm SL, Chinen Fish Market, Nakagusuku Bay; URM-P 41145–41147, 3 specimens, 72–83 mm SL, nearshore Atsuta, Nakagusuku Bay; URM-P 41148–41149, 2 specimens, 64–168 mm SL, Hama, Nakagusuku Bay; URM-P 41150–41157, 8 specimens, 94–161 mm SL, nearshore Atsuta, Nakagusuku Bay; URM-P 41178, 169 mm SL, Nakagusuku Hama Fish Market, Nakagusuku Bay. Hong Kong (6 specimens): FAKU 69111–69115, 5 specimens, 362–406 mm SL; MUFS 10573, 247 mm SL.

**Diagnosis.** A species of *Acanthopagrus* with following combination of characters: pelvic and anal fins pale (yellow in fresh); dorsal fin XI, 11; pored lateral-line scales 46–49 (usually 47 or 48); scale rows above lateral line 4 1/2; cheek with 6 rows of scales; lower edge of infraorbitals straight; no prominent black spot on upper end of pectoral-fin base, and no diffuse black blotch at origin of lateral line.

**Description.** Proportional measurements of the holotype, paratypes, and non-type specimens are shown in Table 1. Data for the holotype are presented first, followed by paratype data in parentheses. Dorsal-fin rays XI, 11 (XI, 11); anal-fin rays III, 8 (III, 8); pectoral-fin rays 15 (15); pelvic-fin rays I, 5 (I, 5); pored lateral-line scales 47 (46–49); scale rows above lateral line 4 1/2 (4 1/2); scale rows below lateral line 13 (12–13); cheek scales 6 (6); gill rakers 6+9=15 (6+9=15); vertebrae 10+14=24 (10+14=24).

Head and body compressed; body rather high, depth at base of pelvic fin 2.2 (2.1–2.4) in SL. Head 3.3 (3.1–3.4) in SL. Dorsal outline of head steep, forming an angle of about 60 degrees to horizontal axis passing from tip of snout to middle of caudal fin base. Snout rather blunt; length 2.5 (2.5–2.8) in HL. Mouth terminal and a little protractile; upper jaw projecting slightly over lower. Maxilla reaching below middle of orbit. Six curved peg-like incisors at front of both jaws. Molar teeth in 4 or 5 rows on each side of upper jaw, and in 2 or 3 rows on each side of lower jaw;

small anteriorly, becoming gradually larger posteriorly (Fig. 3). Ventral edge of infraorbitals above posterior part of upper jaw almost straight without concavity. Nostrils separate; anterior nostril circular with a flap on upper rim, posterior nostril elongate, slit-like. Gill opening wide; posterior end of operculum bluntly pointed. Scales moderately large, circular and weakly ctenoid; interorbital space rather wide, naked; anterior-most head scales rounded without small scales anteriorly. Snout and infraorbitals naked. Cheek with 6 rows of scales reduced dorsally to 3 rows at postorbital region. Lateral line complete, curved parallel to dorsal body profile and straight on caudal peduncle. Scaly sheath developed on bases of soft dorsal and anal fins. Origin of dorsal fin slightly posterior to pectoral-fin base; fourth dorsal-fin spine longest, 5.3 (5.3–6.9) in SL. Pectoral fin elongate and pointed; length 2.3 (2.4–2.7) in SL, fifth ray longest. Pelvic-fin insertion posterior to pectoral-fin axilla, length of longest ray 4.0 (3.9–4.5) in SL. Anal-fin origin below or approximately below tip of pectoral fin; anal-fin base 5.2 (5.1–6.2) in SL; second spine stoutest and longest, length 4.5 (4.3–5.7) in SL, 1.4 (1.2–1.7) in HL; third spine shorter than first soft ray. Caudal fin forked with pointed lobes; upper lobe subequal to or slightly longer than HL, lower lobe subequal to or slightly shorter than HL.

*Color when fresh.* Head and body silvery gray, darker above, silvery white below. Body scales with a dark center, forming longitudinal series of spots following scale rows. Cheek scales with a dark center, forming horizontal series of spots from postorbital to posterior rim of preopercle. No black edge along operculum; lateral line without diffuse black blotch at origin. Dorsal-fin spines dusky silver, rays dusky white; membranes dusky with black blotching and black margin. Pectoral fin pale olivaceous without a conspicuous black spot at upper end of base; axilla with a faint black spot. Pelvic fin canary yellow with basal dusky shading on membranes between spine and third soft ray. Anal fin bright yellow with white ivory spines and rays; mem-

Table 1. Proportional measurements of holotype, paratypes and non-type specimens of *Acanthopagrus chinshira* sp. nov., expressed as % of standard length.

	Holotype URM-P 41079	Paratypes <i>n</i> =15	Nontypes <i>n</i> =102	Mean
Sex	M	M(14)+F(1)		
Standard length (mm)	204	58–399	35–406	
Fork length (mm)	240	70–459	42–466	
Body depth at base of plevic fin	46.6	41.0–47.9	39.9–48.9	44.0
Head length	30.6	29.1–32.1	28.7–34.7	31.6
Snout length	12.4	10.5–12.7	9.8–14.3	11.7
Eye diameter	6.9	5.5–10.6	5.8–13.0	9.4
Interorbital width	8.5	7.7–9.4	7.2–10.4	8.5
Suborbital width	6.3	4.8–6.6	4.8–7.0	5.3
Maxillary length	12.7	11.5–13.9	11.3–15.0	12.5
Internarial width	5.8	5.0–6.2	5.0–7.2	5.8
Predorsal length	41.4	39.1–42.5	39.1–45.0	42.3
Dorsal-fin origin to caudal peduncle	76.4	72.4–77.2	68.9–77.4	73.7
Dorsal-fin base	59.3	56.0–59.9	51.1–60.5	55.6
4th dorsal-fin spine length	18.7	14.4–19.0	13.8–19.4	17.4
Snout to pelvic-fin origin	37.5	36.2–38.9	35.9–43.8	38.3
Pelvic-fin length	24.8	22.1–25.8	20.8–27.1	23.9
Pelvic-fin origin to anal fin origin	33.7	32.9–36.3	29.0–36.5	32.4
Snout to anal-fin origin	69.4	67.8–71.7	67.3–72.9	69.2
Anal-fin base	19.1	16.2–19.5	16.0–19.4	17.7
2nd anal-fin spine length	22.2	17.5–23.6	16.2–23.7	20.2
Caudal-peduncle length	19.2	18.8–20.8	17.6–20.9	19.6
Caudal-peduncle depth	12.6	11.4–12.7	11.0–13.8	12.1
Pectoral-fin length	42.7	37.4–41.2	32.7–40.1	37.1

Mean including type data.

branes between second spine and third soft ray with dusky shading basally. Caudal fin dusky olivaceous with a black band along posterior edge.

**Color in alcohol.** Head and body silvery white. Body with pale yellowish brown streaks along the longitudinal scale rows. Fins pale except for dark blotching, dusky shading and marginal band on membranes.

**Distribution.** The present new species is known from Okinawa Island, Japan, and Hong Kong in this study. It also seems to occur along the northwestern coast of Taiwan based on the literature (Jean and Lee, 1992; Lee, 1993). Attempts to collect *Acanthopagrus chinshira* from southern Japan (Tanega and Yaku Islands northward) and the Ryukyu Islands except for Okinawa Island, were all unsuccessful. On Okinawa Island, *A. chinshira* is currently known only from Nakagusuku Bay and Haneji Inlet, where it is not rare.

**Ecological notes.** Large and fully matured

adults of *Acanthopagrus chinshira* are caught around coastal waters of Okinawa Island in mid-winter, when fishery of this species is carried out by using set nets, gill nets, and bottom long-lines (Watanabe, 1985). Juveniles (<10 cm) occur near shore from late spring to mid-summer. Although in Australia, *A. australis* spawns at the entrance of estuaries with the larvae moving into estuarine nursery habitats (Pollock *et al.*, 1983; Miskiewicz, 1986), *A. chinshira* never shows such a migration (Watanabe, 1985; this study). However, nearly nothing is known about the larvae and juveniles in spite of the commercial importance of this species in Okinawa Island, Japan.

**Etymology.** The specific name “*chinshira*”, used as a noun in apposition, is the local name for this species around Nakagusuku Bay, Okinawa Island. The fishermen around Nakagusuku Bay clearly distinguish this species from the other congeneric species.

**Comparisons.** The present new species has



often been misidentified as *Acanthopagrus australis* in Japan and Taiwan (see Akazaki, 1984; Jean and Lee, 1992; Lee, 1993). *Acanthopagrus chinshira* is distinguished from *A. australis* by 2 meristic characters: number of cheek scales (6 vs. 5), number of pored lateral-line scales (46–50, mean 47.4 vs. 43–49, mean 45.8, significant in Mann-Whitney *U*-test,  $p < 0.05$ ) (Table 2). In morphometric characters, 10 significant differences: eye diameter, suborbital width, interorbital width, distance between anterior nostrils, distance between dorsal-fin origin and caudal peduncle, 4th dorsal-fin spine length, pelvic-fin spine length, 2nd anal-fin spine length, length of longest anal-fin soft ray, and pectoral-fin length are observed between both species (ANCOVA,  $p < 0.01$ ), of which 2 (4th dorsal-fin spine length and 2nd anal-fin spine length) are shown in Fig. 4. Coloration is also different: a black spot on the upper end of the pectoral fin base is not distinct in *A. chinshira* (vs. present in *A. australis*) (Fig. 2).

The members of the genus *Acanthopagrus* except for *Acanthopagrus bifasciatus* (Forsskål, 1775) currently regarded as valid are divided into 3 groups by the count of scale rows above lateral line: 1) *Acanthopagrus berda* (Forsskål, 1775), *Acanthopagrus latus* (Houttuyn, 1782), *Acanthopagrus palmaris* (Whitley, 1935), and *Acanthopagrus taiwanensis* Iwatsuki and Carpenter, 2006 having 3 1/2 scale rows from spinous dorsal to lateral line; 2) *Acanthopagrus akazakii* Iwatsuki, Kimura and Yoshino, 2006, *A. australis*,

*Acanthopagrus butcheri* (Munro, 1949), *Acanthopagrus novaecaledoniae* (Castelnau, 1873), *Acanthopagrus sivicolus* Akazaki, 1962, *Acanthopagrus longispinnis* (Valenciennes, 1830), and *A. chinshira* having 4 1/2 scale rows above lateral line; and 3) *Acanthopagrus schlegelii* (Bleeker, 1854) having more than 4 1/2 scale rows above lateral line (5 1/2–6 1/2) (Table 2). The morphological characters observed in this study, distinguish *A. chinshira* from the other species of the second group (4 1/2 scale rows above lateral line) and other congeneric species are listed in Tables 2–5 (meristic characters) and in Table 6 (morphometric and other characters). *Acanthopagrus longispinnis* (= *Chrysophrys longispinnis* Valenciennes in Cuvier and Valenciennes, 1830), often regarded as a junior synonym of *A. latus* (e.g., Munro, 1949; Akazaki, 1962), is tentatively treated as valid, because the syntypes except for a Japanese specimen deposited at ZMB (about the type series, see Bauchot and Daget, 1972) and all the specimens examined here had 4 1/2 scale rows above lateral line and XII, 12 dorsal-fin rays. Although further taxonomic study should be needed to confirm the validity of *C. longispinnis*, the number of dorsal-fin rays of this species is unique in the genus and clearly different from *A. chinshira*. The holotype of *A. novaecaledoniae* has fewer number of cheek scales (5 vs. 6) and slender body (37% SL vs. 40–49% SL), being different from *A. chinshira* (see Iwatsuki *et al.*, 2006). *Acanthopagrus akazakii* is distinguished from *A. chinshira* in having shorter second anal-

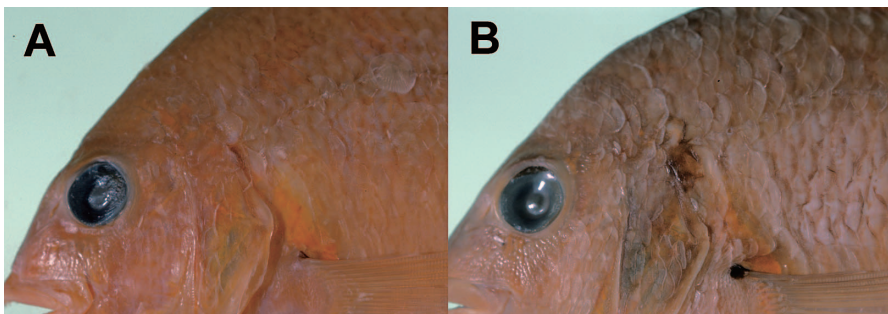


Fig. 2. Markings on posterior edge of operculum and upper base of pectoral fin in 2 species of *Acanthopagrus*. A, *A. chinshira* sp. nov., URM-P 23589; B, *A. australis*, URM-P 20281.

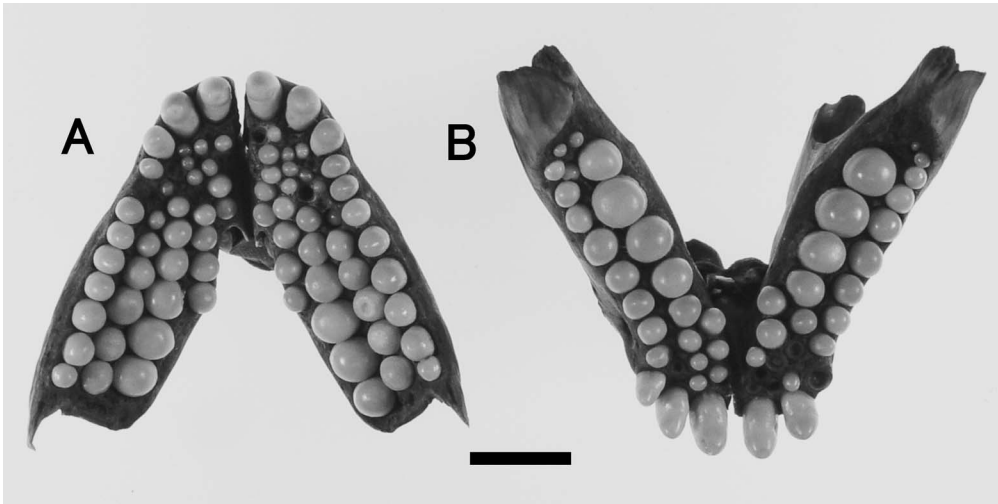


Fig. 3. Dentitions of upper jaw (A) and lower jaw (B) in *Acanthopagrus chinshira* sp. nov., URM-P 32556. Scale indicates 10 mm.

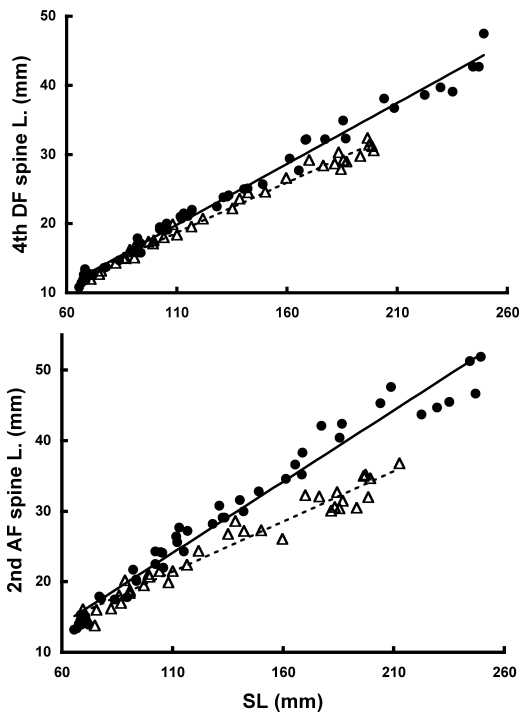


Fig. 4. Relationships of 4th dorsal spine length and 2nd anal spine length to standard length in *Acanthopagrus chinshira* sp. nov. (solid circles) and *A. australis* (open triangles).

fin spine (shorter than vs. longer than anal-fin base) (see Iwatsuki *et al.*, 2006). *Acanthopagrus bifasciatus* is clearly different from the other members of the genus in having 2 black bars on head and more anal-fin rays (III, 10–12) (Forsskål, 1775; Randall, 1983; Smith and Smith, 1986).

From the results of genetic study using allozyme electrophoretic analysis, *A. chinshira* is a distinct species from *A. australis*, *A. berda*, *A. sivicolus*, and *A. schlegelii* (see Kume *et al.*, submitted). Another genetic study of comparative analysis of mtDNA (entire D-loop region and a part of 12S rRNA, total 1471 bp) also suggested that *A. chinshira* (as *A. australis* in the literature) is a distinct species from the sympatric congeners, *A. berda*, *A. schlegelii*, and *A. latus* (see Jean *et al.*, 1995).

**Remarks.** As there has been no recent revision of the genus *Acanthopagrus*, we briefly review here all the nominal species of *Acanthopagrus* except for *Coius datnia* Hamilton, 1822, *Dentex hasta* Valenciennes in Cuvier and Valenciennes, 1830, *Chrysophrys cuvieri* Day, 1875, and *Petrus belayewi* Hora and Misra, 1943, which belong to the genus *Sparidentex* Munro, 1948 owing to absence of molar teeth on jaws. Among 29 nominal species in the genus *Acan-*

*thopagrus*, 12 species (*A. akazakii*, *A. australis*, *A. berda*, *A. bifasciatus*, *A. butcheri*, *A. latus*, *A. longispinnis*, *A. novaecaledoniae*, *A. palmaris*, *A. schlegelii*, *A. sivicolus*, *A. taiwanensis*) are currently regarded as valid and the remaining 17 species are junior synonyms of other species.

Eight nominal species of the 17 synonyms, *Sparus hasta* Bloch and Schneider 1801, *Chrysophrys calamara* Valenciennes in Cuvier and Valenciennes, 1830, *Chrysophrys madagascariensis* Valenciennes in Cuvier and Valenciennes, 1830, *Chrysophrys vagus* Peters, 1852, *Pagrus caffer* Castelnau, 1861, *Chrysophrys berda* var. *calamara* Day, 1875, *Chrysophrys estuarius* Gilchrist and Tompson, 1908, and *Chrysophrys robinsoni* Gilchrist and Tompson, 1908, are currently treated as junior synonyms of *A. berda* (= *Sparus berda* Forsskål, 1775) (Munro, 1949; Bauchot and Skelton, 1986; Smith and Smith, 1986; Iwatsuki and Carpenter, 2006; Iwatsuki *et al.*, 2006). *Acanthopagrus berda* can be distinguished from *A. chinshira* sp. nov. in having fewer scale rows above lateral line (3 1/2 vs. 4 1/2) and pored lateral-line scales (42–45 vs. 46–50) (Table 2). Three of the remaining 9 synonyms, *Chrysophrys auripes* Richardson, 1846, *Chrysophrys xanthopoda* Richardson, 1846, and *Chrysophrys rubroptera* Tirant, 1883, are junior synonyms of *A. latus* (= *Sparus latus* Houttuyn, 1782) (Munro, 1949). *Acanthopagrus latus* differs from *A. chinshira* in having fewer scale rows above lateral line and pored lateral-line scales (3 1/2 and 44–47 vs. 4 1/2 and 46–50, respectively) (Table 2). Identification of *C. auripes*, *C. xanthopoda*, and *C. rubroptera* was confirmed by the figures (Reeves' drawing numbers 128 and 85) in the library of BMNH (see Richardson, 1846 and Whitehead, 1969 for the Reeves' drawings), and the figure of a syntype shown in Kottelat (1986: fig. 12). Three of the remaining 6 synonyms, *Pagrus macrocephalus* Basilewsky, 1855, *Chrysophrys swinhonis* Günther, 1874 and *Lutianus hudsoni* Evermann and Shaw, 1927, are herein regarded as junior synonyms of *A. schlegelii*. *Acanthopagrus schlegelii* differs from *A. chinshira* in having more scale rows above

lateral line, more cheek scales, and more pored lateral-line scales (5 1/2–6 1/2, 7, and 51–53 vs. 4 1/2, 6, and 46–50, respectively) (Table 2). Identification of *P. macrocephalus*, *C. swinhonis*, and *L. hudsoni* was confirmed by the original description and figure [Tab. I fig. 3, not Tab. III fig. 1 as referred in the text of Basilewsky (1855)], photograph of the syntypes (BMNH 1874.1.16.2), and photograph of the holotype (CAS 505) shown on the Primary Types Imagebase of CAS, respectively. The remaining 3 nominal species, *Labrus catenula* Lacepède, 1801, *Sparus mylio* Lacepède, 1802, and *Holocentrus rabaji* Lacepède, 1801 are junior synonyms of *A. bifasciatus* according to Dor (1984) and Fricke (1999). Consequently, no available name is known for the present new species.

**Comparative materials.** *Acanthopagrus australis* (41 specimens). Australia: MUFS 3495–3496, 3500–3501, 4 specimens, 135–213 mm SL, Port Jackson, Sydney, NSW.; MUFS 7411–7412, 2 specimens, 197–199 mm SL, Australia; QM I. 26309, 5 specimens, 69–108 mm SL, Caboolture River Mouth, SE Queensland; QM I. 26327, 10 specimens, 79–122 mm SL, Deception Bay, Moreton Bay, SE Queensland; QM I. 23571, 10 specimens, 71–138 mm SL, 19°50'S, 147°42'E, Molongle Creek, east of Gumlu, NE Queensland; QM I. 31846, 150 mm SL, near mouth, north side, Tweed River, SE Queensland; URM-P 18691, 193 mm SL, Sydney, NSW.; URM-P 20281–20282, 23501–23505, 23507–23508, 9 specimens, 182–199 mm SL, Brisbane Fish Market, Brisbane, Qld. *Acanthopagrus berda* (total 45 specimens). India (1 specimen): MNHN 5261 (1 of 3 syntypes of *Chrysophrys calamara*), 148 mm SL, Malabar. Australia (3 specimens): FAKU 125925–125927, 3 specimens, 78–144 mm SL. Ryukyu Islands, Japan (41 specimens): URM-P 0814, 148 mm SL, Urauchi River, Iriomote I.; URM-P 0816, 1062–1063, 3 specimens, 150–274 mm SL, Shiira River, Iriomote I.; URM-P 1095, 199 mm SL, Shirahama, Iriomote I.; URM-P 23511–23516, 23518, 23520–23522, 10 specimens, 141–346 mm SL, Yaeyama Is.; URM-P 28483, 65 mm SL, Urauchi River, Iriomote I.; URM-P 29626–29627, 29629–29630, 4 specimens, 76–112 mm SL, Nakama River, Iriomote I.; URM-P 31214, 105 mm SL, Shiira River, Iriomote I.; URM-P 32649, 33628, 2 specimens, 155–165 mm SL, Urauchi River, Iriomote I.; URM-P 36354–36356, 3 specimens, 106–116 mm SL, Shiira River, Iriomote I.; URM-P 38474, 225 mm SL, Yaeyama Is.; URM-P 41046–41048, 41050–41051, 41070–41078, 14 specimens, 123–195 mm SL, Yaeyama Is. *Acanthopa-*





*grus butcheri* (2 specimens). Australia: MUFS 3498–3499, 80–95 mm SL, Port Jackson, Sydney. *Acanthopagrus latus* (total 19 specimens). Japan (18 specimens): FAKU 25244, 25248, 25255-2, 25479, 25482, 25483, 6 specimens, 139–159 mm SL, Shiroya, Aichi Pref.; MUFS 10057, 121 mm SL, Ibi River, Nichinan, Miyazaki Pref.; MUFS 10578, 90 mm SL, Akamizu, Miyazaki Pref.; MUFS 13079, 233 mm SL, Miyazaki Pref.; URM-P 5032, 2 specimens, 56–71 mm SL, Ichinose River, Miyazaki Pref.; URM-P 5035, 83 mm SL, Kiyotake River, Miyazaki; URM-P 23423, 179 mm SL, Miyazaki Central Fish Market, Miyazaki; URM-P 41035, 41037–41040, 5 specimens, 235–301 mm SL, Kagoshima. Taiwan (1 specimen): MUFS 2621, 141 mm SL, Tungking. *Acanthopagrus longispinnis* (total 13 specimens). India (10 specimens): MNHN 5282 (2 of 3 syntypes of *C. longispinnis*), 121–144 mm SL, Gulf of Bengal; MUFS 19109, 19115, 19123–19124, 19176, 19178, 19568, 7 specimens, 50–192 mm SL, Calcutta; MUFS 20973, 213 mm SL, Mumbai. Arabian Sea (2 specimens): FAKU 17900, 17902, 2 specimens, 133–147 mm SL. Persian Gulf (1 specimen): MUFS 21415, 127 mm SL, Kuwait. *Acanthopagrus novaecaledoniae* (1 specimen). New Caledonia: NMV 51854 (holotype of *C. novaecaledoniae*), 207 mm SL, Noumea. *Acanthopagrus schlegelii* (total 22 specimens). Japan (4 specimens): URM-P 05041, 62 mm SL; URM-P 10679–10680, 2 specimens, 147–203 mm SL; URM-P 10695, 177 mm SL. China (18 specimens): BMNH 1874.1.16.2 (syntypes of *C. swinhonis*), 4 specimens, 86–282 mm SL, Chefoo, Shantung Prov.; SFU 51–1079, 11 specimens, 30–63 mm SL, Tsingdao, Shandong; SFU 51–1098, 137 mm SL, Tsingdao, Shandong; SFU 56–9316, 299 mm SL, Tsingdao, Shandong; SFU 57–0026, 136 mm SL, Shidao, Shandong. *Acanthopagrus sivicolus* (52 specimens). Ryukyu Islands, Japan: URM-P 8686, 232 mm SL, Naha Fish Market, Naha, Okinawa I.; URM-P 23523–23525, 23527–23528, 23530–23532, 23534–23535, 23537, 11 specimens, 193–245 mm SL, Yaeyama Is.; URM-P 23538, 171 mm SL, Haneji, Nago, Okinawa I.; URM-P 30292, 145 mm SL, nearshore Ohyama, Ginowan, Okinawa I.; URM-P 31148–31149, 2 specimens, 171–188 mm SL, Okinawa Prefectural Fish Market, Okinawa I.; URM-P 32579, 152 mm SL, Urauchi River, Iriomote I.; URM-P 33858, 141 mm SL, Makiya-ohkawa River, Nago, Okinawa I.; URM-P 40971–40975, 40977–40979, 8 specimens, 182–231 mm SL, Awase Fish Market, Nakagusuku Bay, Okinawa I.; URM-P 40981, 130 mm SL, Nakagusuku Hama Fish Market, Nakagusuku Bay, Okinawa I.; URM-P 41049, 179 mm SL, Yaeyama Is.; URM-P 41142, 325 mm SL, Nakagusuku Hama Fish Market, Nakagusuku Bay, Okinawa I.; URM-P 41196, 41198, 41201–41203, 5 specimens, 79–99 mm SL, nearshore Awase, Nakagusuku Bay, Okinawa I.; URM-P 41227, 41231, 41234, 3 specimens,

70–97 mm SL, Makiya-ohkawa River, Haneji, Nago, Okinawa I.; URM-P 41247, 41251, 41262, 41271–41272, 41278, 6 specimens, 37–57 mm SL, nearshore Gabu, Haneji, Nago, Okinawa I.; URM-P 41291, 41300, 41325, 41337, 41346, 41349, 41356, 7 specimens, 59–101 mm SL, nearshore Awase, Nakagusuku Bay, Okinawa I.; URM-P 41365, 89 mm SL, Kijimuna River, Motobu, Okinawa I.; URM-P 41366, 76 mm SL, nearshore Gabu, Haneji, Nago, Okinawa I.

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### Literature Cited

- Akazaki, M. 1962. Studies on the Spariform fishes: anatomy, phylogeny, ecology and taxonomy. Misaki Marine Biological Institute, Kyoto Univ., Special Report, (1): i-iv+1-368. (In Japanese with English summary.)
- Akazaki, M. 1984. Family Sparidae. Pages 176-178, pl. 167 in H. Masuda, K. Amaoka, C. Araga, T. Uyeno and T. Yoshino, eds. The Fishes of the Japanese Archipelago (English text and plates). Tokai University Press, Tokyo.
- Akazaki, M. 1997. Sparidae. Pages 352-353 in O. Okamura, K. Amaoka, eds. Sea fishes of Japan. Yama-Kei Publishers, Tokyo. (In Japanese.)
- Au, K. C. 1978. A field key to the Hong Kong seabreams of the genus *Mylio* Lacepède, family Sparidae. *Journal of Natural History*, 12: 627-631.
- Basilewsky, S. 1855. Ichthyographia Chinae borealis. *Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou*, 10: 215-263, pls. 1-9.
- Bauchot, M. L. and J. Daget. 1972. Catalogue critique des types de poissons du Muséum national d'Histoire naturelle. *Bulletin du Muséum National d'Histoire Naturelle*, Paris, Sér. 3, (24): 33-100.
- Bauchot, M. L. and P. H. Skelton. 1986. Sparidae. Pages 331-332 in J. Daget, J.-P. Gosse, D. F. E. Thys van den Audenarde, eds. Check-list of the Freshwater Fishes of Africa. ISNB, Bruxelles, vol. 2.
- Bleeker, P. 1854. Fauna ichthyologica Japonicae. Species novae. *Natuurkundig Tijdschrift voor Nederlandsch Indië*, 6: 395-426.
- Bloch, M. E. and J. G. Schneider. 1801. M. E. Blochii, Systema Ichthyologiae iconibus ex illustratum. Post obitum auctoris opus inchoatum absolutum, correxit, interpolavit Jo. Gottlob Schneider, Saxo. Berolini, Berlin, lx+584 pp., 110 pls.
- Castelnaud, F. L. 1861. Mémoire sur les poissons de l'Afrique australe. Paris. Mémoire sur les poissons de l'Afrique Australe, Paris, France, 78 pp.
- Castelnaud, F. L. 1873. Contribution to the ichthyology of Australia. *Proceedings of the Zoological Acclimatization Society of Victoria*, 2: 37-158.
- Cuvier, G. and A. Valenciennes. 1830. Histoire Naturelle des Poissons, vol. 6. F. G. Levrault, Paris, xxiv+559 pp., pls. 141-169.
- Day, F. 1875. The fishes of India; Being a Natural History of the Fishes Known to Inhabit the Seas and Fresh Waters of India, Burma and Ceylon. Part 1. Bernard Quaritch, London, pp. 1-168, 40 pls.
- Dor, M. 1984. CLOFRES. Checklist of the Fishes of the Red Sea. Israel Academy of Sciences and Humanities, Jerusalem, xxii+437 pp.
- Eschmeyer, W. N., ed. 1998. Catalog of Fishes. California Academy of Sciences, San Francisco, vols. 1-3, 2905 pp.
- Evermann, B. W. and T. H. Shaw. 1927. Fishes from Eastern China, with descriptions of new species. *Proceedings of the California Academy of Sciences*, Ser. 4, 16(4): 97-122.
- Forsskål, P. 1775. Descriptiones Animalium Avium, Amphibiorum, Piscium, Insectorum, Vermium; quae in Itinere Orientali observavit. Post mortem auctoris edidit Carsten Niebuhr. Mölleri, Copenhagen, 20+xxxiv+164 pp.
- Fricke, R. 1999. Fishes of the Mascarene Islands (Réunion, Mauritius, Rodriguez). An Annotated Checklist with Description of New Species. Koeltz, Koenigstein, viii+759 pp.
- Gilchrist, J. D. F. and W.W. Tompson. 1908. Descriptions of fishes from the coast of Natal. *Annals of the South African Museum*, 6 (part 2): 145-206
- Gunther, A. 1859. Catalogue of the Acanthopterygian Fishes in the Collection of British Museum. vol. 1. British Museum, London, xxxi+524 pp.
- Günther, A. 1874. Third notice of a collection of fishes made by Mr. Swinhoe in China. *Annals and Magazine of Natural History*, (4), 13: 155.
- Hamilton, F. 1822. An Account of the Fishes Found in the River Ganges and its branches. Edinburgh & London, Fishes Ganges: i-vii+1-405, pls. 1-39.
- Hayashi, M. 2000. Sparidae Pages 856-859, 1567 in T. Nakabo, ed. Fishes of Japan with pictorial keys to the species, 2nd edition. Tokai University Press, Toyo. (In Japanese.)
- Hora, S. L. and K. S. Misra. 1943. On a small collection of fish from Iraq. *Journal of the Asiatic Society of Bengal*, 9(1): 1-15.
- Houttuyn, M. 1782. Beschrijving van eenige Japanese visschen, en andere zee-schepzelen. *Verhandelingen Hollandsche Maatschappij der Haarlm*, 20 (part 2): 311-350.
- Hubbs, C. L. and K. F. Lagler. 1964. Fishes of the Great Lakes Region. University of Michigan Press, Ann Arbor, xv+213 pp., 44 pls.
- Iwatsuki, Y. and K. Carpenter. 2006. *Acanthopagrus taiwanensis*, a new sparid fish (Perciformes), with comparisons to *Acanthopagrus berda* (Forsskål, 1775) and other nominal species of *Acanthopagrus*. *Zootaxa*, 1202: 1-19.
- Iwatsuki, Y., S. Kimura and T. Yoshino. 2006. A new species: *Acanthopagrus akazakii* (Perciformes: Sparidae) from New Caledonia and a similar species, *A. berda* (Forsskål, 1775) with comments on known nominal species. *Ichthyological Research*, 53(4): 406-414.

- Jean, C. T. and S. C. Lee. 1992. New record of sparid fish, *Acanthopagrus australis* from Taiwan. *Bulletin of the Institute of Zoology, Academia Sinica*, 31: 221–223.
- Jean, C. T., C. F. Hui, S. C. Lee and C. T. Chen. 1995. Variation in mitochondrial DNA and phylogenetic relationships of fishes of the subfamily Sparinae (Perciformes: Sparidae) in the coastal waters of Taiwan. *Zoological Studies*, 34: 270–280.
- Kottelat, M. 1986. A review of the nominal species of fishes described by G. Tirant. *Nouvelles Archives du Muséum d'histoire naturelle de Lyon*, 24: 5–24.
- Kume, M., T. Yoshino and M. Nishida. (submitted) Genetic divergence of the yellow-fin seabream, *Acanthopagrus australis* (Perciformes: Sparidae), between Australian and Okinawan populations.
- Lacepède, B. G. E. 1801. *Histoire Naturelle des Poissons*, vol. 3. Plassan, Paris, i–lxvi+1–558 pp., pls. 1–34.
- Lacepède, B. G. E. 1802. *Histoire Naturelle des Poissons*, vol. 4. Plassan, Paris, xlv+728 pp., pls. 1–16.
- Lee, S. C. 1993. Sparidae. Pages 363–366, pl. 104 in S. C. Shen, ed. *Fishes of Taiwan* (in Chinese). Department of Zoology, University of Taiwan Press, Taipei.
- Masuda, H., C. Araga and T. Yoshino. 1975. *Coastal Fishes of Southern Japan*. Tokai University Press, Tokyo, 379 pp.
- Miskiewicz, A. G. 1986. The season and length at entry into a temperate Australian estuary of the larvae of *Acanthopagrus australis*, *Rhabdosargus sarba* and *Chrysophrys auratus* (Teleostei: Sparidae). Pages 740–747 in T. Uyeno, R. Arai, T. Taniuchi, K. Matsuura, eds. *Indo-Pacific Fish Biology*. Proceedings of the 2nd International Conference on Indo-Pacific Fishes, Ichthyological Society of Japan, Tokyo.
- Munro, I. S. R. 1948. *Sparidentex hasta* (Valenciennes), a new name for *Chrysophrys cuvieri* Day. *Copeia*, 1948(4): 275–280.
- Munro, I. S. R. 1949. Revision of Australian silver breams *Mylio* and *Rhabdosargus*. *Memoirs of the Queensland Museum*, 12: 182–223, pls. 16–23.
- Peters, W. 1852. Diagnosen von neuen Flussfischen aus Mossambique. *Monatsberichte der Akademie Wissenschaften zu Berlin*, 1852: 275–276, 681–685.
- Pollock, B. R., H. Weng and R. M. Morton. 1983. The seasonal occurrence of postlarval stage of yellowfin bream, *Acanthopagrus australis* (Günther), and some factors affecting their movement into an estuary. *Journal of Fish Biology*, 22: 409–415.
- Randall, J. E. 1983. *Red Sea Reef Fishes*. IMMEL Publishing, London, 192 pp.
- Richardson, J. 1846. Report on the ichthyology of the Seas of China and Japan. *Report of the British Association for Advancement of Science*, 1845: 187–320.
- Smith, J. L. B. and M. M. Smith. 1986. Family No. 183: Sparidae. Pages 580–595 in M. M. Smith and P. C. Heemstra, eds. *Smiths' Sea Fishes*. J. L. B. Smith Institute of Ichthyology, Grahamstown.
- Tirant, G. 1883. Mémoire sur les poissons de la rivière de Hué. *Bulletin de la Société des Études Indochinoises*, 1883: 80–101.
- Watanabe, T. 1985. [Research on commercially important fishes in Kin and Nakagusuku Bays, I: the fishery of “chinshira” (*Acanthopagrus australis*)] *Reports of Okinawa Prefectural Fisheries Experimental Station*, 1983: 28–39. (in Japanese.)
- Whitehead, P. J. P. 1969. The Reeves collection of Chinese fish drawings. *Bulletin of the British Museum (Natural History), Historical Series*, 3: 193–233, pls. 1–29.
- Whitley, G. P. 1935. Studies in ichthyology, no. 9. *Records of the Australian Museum*, 19(4): 215–258.

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